

U.S. Patent Application Serial No. 09/988,499  
Amendment dated December 30, 2003  
Reply to OA of September 30, 2003

**AMENDMENTS TO THE CLAIMS:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims**

1           Claim 1 (currently amended): An injection molding system comprising:  
2           an injection molding apparatus injecting melted resin into a die, the die being  
3           placed forward of one end of the injection molding apparatus;  
4           an air feeder for feeding at least air ~~from an opposite side to a nozzle of~~ into the  
5           injection molding apparatus through a mouth arranged at an end of the injection molding  
6           apparatus opposite to the one end of the injection molding apparatus;  
7           a resin pellet feeding passage for feeding resin pellets into the injection molding  
8           apparatus, the resin pellet feeding passage feeding the pellets into the injection molding  
9           apparatus at a location spaced apart from where the mouth feeds the at least air into the  
10          injection molding apparatus;

11 a pellet feeding regulator for controlling a feed of the resin pellets from [[a]] the  
12 resin pellet feeding passage into the injection molding apparatus;

13 a pellet exhaust gas passage for passing moisture and exhaust gas which are  
14 generated when the resin pellets melt in the injection molding apparatus; and

15 a decompressor connected to the exhaust gas passage for exhausting the moisture  
16 and the exhaust gas from a pellet feeding passage side to an outside of the injection  
17 molding apparatus.

1 Claim 2 (currently amended): An injection molding system comprising:

2 an injection molding apparatus;

3 an air feeder for feeding at least air to ~~from an opposite side to a nozzle of the~~  
4 injection molding apparatus;

5 a resin pellet feeding passage for feeding resin pellets into the injection molding  
6 apparatus;

7 a pellet feeding regulator for controlling a feed of the resin pellets from [[a]] the  
8 resin pellet feeding passage into the injection molding apparatus;

9 a pellet exhaust gas passage for passing moisture and exhaust gas which are  
10 generated when the resin pellet melt in the injection molding apparatus; and

11 a decompressor connected to the exhaust gas passage for exhausting the moisture  
12 and the exhaust gas from the pellet feeding passage side to the outside of the injection  
13 molding apparatus, and moisture and exhaust gas which are generated in a die.

1 Claim 3 (currently amended): An injection molding system comprising:

2 an injection molding apparatus injecting melted resin into a die, the die being  
3 placed forward of one end of the injection molding apparatus;

4 an air feeder for feeding at least air ~~from an opposite side to a nozzle of~~ into the  
5 injection molding apparatus through a mouth arranged at an end of the injection molding  
6 apparatus opposite to the one end of the injection molding apparatus;

7 a resin pellet feeding passage for feeding resin pellets into the injection molding  
8 apparatus, the resin pellet feeding passage feeding the pellets into the injection molding  
9 apparatus at a location spaced apart from where the mouth feeds the at least air into the  
10 injection molding apparatus;

11 a pellet feeding regulator for controlling a feed of the resin pellets from ~~[[a]]~~ the  
12 resin pellet feeding passage into the injection molding apparatus;

13 a pellet exhaust gas passage for passing moisture and exhaust gas which are  
14 generated when the resin pellets melt in the injection molding apparatus;

15 a decompressor connected to the exhaust gas passage for exhausting the moisture  
16 and the exhaust gas from a pellet feeding passage side to an outside of the injection  
17 molding apparatus; and

18 a device for preventing the moisture and the exhaust gas which pass through the  
19 gas exhaust passage from contacting the resin pellets passing through the pellet feeding  
20 passage, with the moisture and the exhaust gas passing through a space outside the pellet  
21 feeder.

1 Claim 4 (currently amended): An injection molding system comprising:

2 an injection molding apparatus injecting melted resin into a die, the die being  
3 placed forward of one end of the injection molding apparatus;

4 an air feeder for feeding at least air ~~from an opposite side to a nozzle of~~ into the  
5 injection molding apparatus through a mouth arranged at an end of the injection molding  
6 apparatus opposite to the one end of the injection molding apparatus;

7 a resin pellet feeding passage for feeding resin pellets into the injection molding  
8 apparatus, the resin pellet feeding passage feeding the pellets into the injection molding  
9 apparatus at a location spaced apart from where the mouth feeds the at least air into the  
10 injection molding apparatus;

11 a pellet feeding regulator for controlling a feed of the resin pellets from ~~[[a]]~~ the  
12 resin pellet feeding passage into the injection molding apparatus;

13 a pellet exhaust gas passage for passing moisture and exhaust gas which are  
14 generating when the resin pellets melt in the injection molding apparatus;

15 a decompressor connected to the exhaust gas passage for exhausting the moisture  
16 and the exhaust gas form a pellet feeding passage side to an outside of te injection  
17 molding apparatus; and

18 a removing apparatus placed at the exhaust gas passage.

1           Claim 5 (currently amended): An injection molding system comprising:  
2           an injection molding apparatus;  
3           an air feeder for feeding at least air to ~~from an opposite side to a nozzle of the~~  
4 injection molding apparatus;  
5           a resin pellet feeding passage for feeding resin pellets into the injection molding  
6 apparatus;  
7           a pellet feeding regulator for controlling a feed of the resin pellets from the resin  
8 pellet feeding passage into the injection molding apparatus;  
9           an exhaust gas passage for passing moisture and exhaust gas which are generated  
10 when the resin pellets melt in the injection molding apparatus;  
11           a decompressor connected to the exhaust gas passage for exhausting the moisture  
12 and the exhaust gas from a pellet feeding passage side to an outside of the injection  
13 molding apparatus; and  
14           a detector for detecting an accumulation amount of the resin pellets situated inside  
15 a cylinder of the injection molding apparatus.

1           Claim 6 (currently amended): An injection molding system comprising:  
2           an injection molding apparatus;  
3           an air feeder for feeding at least air to ~~from an opposite side to a nozzle of the~~  
4 injection molding apparatus;  
5           a resin pellet feeding passage for feeding resin pellets into the injection molding  
6 apparatus;  
7           a pellet feeding regulator for controlling a feed of the resin pellets from the resin  
8 pellet feeding passage into the injection molding apparatus;  
9           an exhaust gas passage for passing moisture and exhaust gas which are generated  
10 when the resin pellets melt in the injection molding apparatus;  
11          a decompressor connected to the exhaust gas passage for exhausting the moisture  
12 and the exhaust gas from a pellet feeding passage side to an outside of the injection  
13 molding apparatus;  
14          a detector for detecting an accumulation amount of the resin pellets situated inside  
15 a cylinder of the injection molding apparatus;  
16          a device for preventing the moisture and the exhaust gas which pass through the  
17 exhaust gas passage from contacting with the resin pellets passing through the pellet

18 feeding passage; and  
19 a removing apparatus placed at the exhaust gas passage.

1 Claim 7 (original): The injection molding system of claim 1, 2, 3, 4, 5 or 6,  
2 wherein the degree of decompression of said decompressor is about 40Kpa (300 torr) or  
3 more.

1 Claim 8 (original): The injection molding system of claim 7, wherein the degree  
2 of compression is about 70 Kpa or more.

1 Claim 9 (original): The injection molding system of claim 7, wherein the degree  
2 of compression is about 80 Kpa to 95 Kpa.

1 Claim 10 (original): The injection molding system of claim 5 or 6, wherein said  
2 detector is situated within about 10 mm from an upper end of a flight of a screw inside  
3 the cylinder.



1 Claim 11 (currently amended): A resin pellet feeding unit comprising:

2 a device for automatically feeding pellets with a vacuum interception valve, to  
3 ~~intercept a pellet storage tank~~ the device and the valve being disposed to intercept a  
4 passage between a pellet storage tank and other pellet storage;

5 a resin pellet feeding passage for feeding resin pellets into an injection molding  
6 apparatus;

7 a pellet feeding regulator for controlling a feed of the resin pellets from the resin  
8 pellet feeding passage into the injection molding apparatus;

9 an exhaust gas passage for passing moisture and exhaust gas which are generated  
10 when the resin pellets melt in the injection molding apparatus; and

11 a decompressor connected to the exhaust gas passage for exhausting the moisture  
12 and the exhaust gas from a pellet feeding passage side to an outside of the injection  
13 molding apparatus.

1 Claim 12 (currently amended): A resin pellet feeding unit comprising:

2 a device for automatically feeding pellets with a vacuum interception valve, the  
3 device and the valve being disposed to intercept a passage between a pellet storage tank  
4 and other pellet storage;

5 a resin pellet feeding passage for feeding resin pellets into an injection molding  
6 apparatus;

7 a pellet feeding regulator for controlling feed of the resin pellets from the resin  
8 pellet feeding passage into the injection molding apparatus;

9 an exhaust gas passage for passing moisture and exhaust gas which are generated  
10 when the resin pellets melt in the injection molding apparatus;

11 a decompressor connected to the exhaust gas passage for exhausting the moisture  
12 and the exhaust gas from a pellet feeding passage side to an outside of the injection  
13 molding apparatus; and

14 a device for preventing the moisture and the exhaust gas which pass through the  
15 exhaust gas passage from contacting the resin pellets passing through the pellet feeding  
16 passage.

1           Claim 13 (original): A resin pellet feeding unit comprising:  
2           a resin pellet feeding passage for feeding resin pellets into an injection molding  
3           apparatus;  
4           a pellet feeding regulator for controlling a feed of the resin pellets from the resin  
5           pellet feeding passage into the injection molding apparatus;  
6           an exhaust gas passage for passing moisture and exhaust gas which are generated  
7           when the resin pellets melt in the injection molding apparatus;  
8           a decompressor connected to the exhaust gas passage for exhausting the moisture  
9           and the exhaust gas from a pellet feeding passage side to an outside of the injection  
10          molding apparatus; and  
11          a detector for detecting an accumulation amount of the resin pellets deposited in  
12          the injection molding apparatus, the detector disposed inside a cylinder of the injection  
13          molding apparatus.

1           Claim 14 (currently amended): A resin pellet feeding unit comprising:

2           a device for automatically feeding pellets with a vacuum interception valve, the  
3           device and the valve being disposed to intercept a passage between a pellet storage tank,  
4           and other pellet storage;

5           a resin pellet feeding passage for feeding resin pellets into an injection molding  
6           apparatus;

7           a pellet feeding regulator for controlling a feed of the resin pellets from the resin  
8           pellet feeding passage into the injection molding apparatus;

9           an exhaust gas passage for passing moisture and exhaust gas which are generated  
10          when the resin pellets melt in the injection molding apparatus;

11          a decompressor connected to the exhaust gas passage for exhausting the moisture  
12          and the exhaust gas from a pellet feeding passage side to an outside of the injection  
13          molding apparatus; and

14          a removing apparatus placed at the exhaust gas passage.

1           Claim 15 (original): A resin pellet feeding unit comprising:  
2           a resin pellet feeding passage for feeding resin pellets into an injection molding  
3           apparatus;  
4           a pellet feeding regulator for controlling feed of the resin pellets from the resin  
5           pellet feeding passage into the injection molding apparatus;  
6           an exhaust gas passage for passing moisture and exhaust gas which are generated  
7           when the resin pellets melt in the injection molding apparatus;  
8           a decompressor connected to the exhaust gas passage for exhausting the moisture  
9           and the exhaust gas from a pellet feeding passage side to an outside of the injection  
10          molding apparatus;  
11          a detector for detecting an accumulation amount of the resin pellets deposited in  
12          the injection molding apparatus, the detector disposed inside a cylinder of the injection  
13          molding apparatus;  
14          a device for preventing the moisture and the exhaust gas which pass through the  
15          exhaust gas passage from contacting the resin pellets passing through the pellet feeling  
16          passage; and  
17          a removing apparatus placed at the exhaust gas passage.

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1           Claim 16 (original): A resin feeding unit of claim 13 or 15, wherein said detector  
2           is provided on said pellet feeder or a water jacket of the cylinder.

1           Claim 17 (original): A resin pellet feeding unit of claim 13 or 15, wherein said  
2           pellet feeder extends inside the cylinder.

1           Claim 18 (original): A resin pellet feeding unit of claim 16, wherein said detector  
2           is situated within about 10 mm from an upper end of a flight of a screw inside the  
3           cylinder.

1           Claim 19 (original): A resin pellet feeding unit of claim 11, 12 or 15, wherein  
2           said device for preventing contact is provided on the pellet feeder and the exhaust gas  
3           passage.

1           Claim 20 (original): A resin pellet feeding unit of claim 19, wherein said pellet  
2           feeder is made of copper.

1           Claim 21 (original): A resin pellet feeding unit of claim 14 or 15, wherein said  
2 removing apparatus is provided on the exhaust gas passage.

1           Claim 22 (original): An injection molding process comprising the steps of:  
2           feeding resin pellets to provide a given space between a location of an  
3 accumulation amount of the resin pellets inside of a cylinder and an inner wall of the  
4 cylinder of an injection molding apparatus; and  
5           exhausting, out of the cylinder, exhaust gas and moisture generated when the resin  
6 pellets melt in the cylinder as well as air fed from an opposite side to a nozzle of a  
7 front end of the cylinder from a pellet feeding side of a pellet feeding zone of the  
8 cylinder through a pellet exhaust gas passage by reducing pressure, of a predetermined  
9 decompression degree, inside of the cylinder through continuous driving of a vacuum  
10 pump which acts as a decompression during operation of the injection molding apparatus.

1           Claim 23 (original) An injection molding process comprising the steps of:

2           feeding resin pellets to provide a given space between a location of an  
3           accumulation amount of the resin pellets inside of a cylinder and an inner wall of the  
4           cylinder of an injection molding apparatus, the feeding of the resin pellets being carried  
5           out without contacting exhaust gas and moisture generated when the pellets are melted  
6           inside of the cylinder; and

7           exhausting, out of the cylinder, exhaust gas and moisture generated when the resin  
8           pellets melt in the cylinder as well as air fed from an opposite side to a nozzle of a front  
9           end of the cylinder from a pellet feeding side of a pellet feeding zone of the cylinder  
10          through a pellet exhaust gas passage by reducing pressure inside of the cylinder through  
11          driving of a vacuum pump which acts as a decompression.

1           Claim 24 (original): An injection molding process comprising the steps of:

2           feeding resin pellets to provide a given space between a location of accumulation  
3           amount of the resin pellets inside of a cylinder and an inner wall of the cylinder of an  
4           injection molding apparatus; and



5           exhausting, out of the cylinder, exhaust gas and moisture generated when the resin  
6 pellets melt in the cylinder as well as air fed from an opposite side to a nozzle of a front  
7 end of the cylinder from a pellet feeding side of a pellet feeding zone of the cylinder  
8 through a pellet exhaust gas passage by reducing pressure, of the predetermined  
9 decompression degree, inside of the cylinder through continuous driving of a vacuum  
10 pump which acts as a decompression during operation of the injection molding apparatus.

1           Claim 25 (original): An injection molding process comprising the steps of:  
2           feeding resin pellets to provide a given space between a location of accumulation  
3 amount of the resin pellets inside of a cylinder and an inner wall of the cylinder of an  
4 injection molding apparatus; and

5           exhausting, out of the cylinder, exhaust gas and moisture generated when the resin  
6 pellets melt in the cylinder as well as air fed from an opposite side to a nozzle of a front  
7 end of the cylinder from a pellet feeding side of a pellet feeding zone of the cylinder  
8 through a pellet exhaust gas passage by reducing pressure, of the predetermined  
9 decompression degree, inside of the cylinder through continuous driving of a vacuum

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10 pump which acts as a decompression during operation of the injection molding apparatus;  
11 and

12 detecting a location of the accumulation amount of the resin pellets to control the  
13 feeding of the resin pellets based on the detection information.

1 Claim 26 (currently amended): An injection molding process of claim 22, 23, 24  
2 or 25, wherein a degree of decompression is set at [[400]] 40 Kpa (about 300 Torr) or  
3 more.

1 Claim 27 (original): The injection molding process of claim 26, wherein the  
2 degree of decompression is about 70 Kpa or more.

1 Claim 28 (original): the injection molding process of claim 26, wherein the degree  
2 of decompression is about 80 Kpa to 95 Kpa.

1           Claim 29 (new): An injection molding system comprising:  
2           an injection molding apparatus injecting melted resin into a die, the die being  
3           placed forward of one end of the injection molding apparatus;  
4           an air feeder for feeding at least air into the injection molding apparatus through  
5           a mouth arranged at an end of the injection molding apparatus opposite to the one end  
6           of the injection molding apparatus;  
7           a resin pellet feeding passage for feeding resin pellets into the injection molding  
8           apparatus, the resin pellet feeding passage feeding the pellets into the injection molding  
9           apparatus at a location spaced apart from where the mouth feeds the at least air into the  
10          injection molding apparatus;  
11          a pellet feeding regulator for controlling a feed of the resin pellets from the resin  
12          pellet feeding passage into the injection molding apparatus;  
13          a pellet exhaust gas passage for passing moisture and exhaust gas which are  
14          generated when the resin pellets melt in the injection molding apparatus;  
15          a decompressor connected to the exhaust gas passage for exhausting the moisture  
16          and the exhaust gas from a pellet feeding passage side to an outside of the injection  
17          molding apparatus; and

18           a device for preventing the moisture and the exhaust gas which pass through the  
19           gas exhaust passage from contacting the resin pellets passing through the pellet feeding  
20           passage, with the moisture and the exhaust gas passing through a space outside the pellet  
21           feeder,

22           wherein the degree of decompression of said decompressor is at least one selected  
23           from among about 40Kpa (300 torr) or more, about 70 Kpa or more, and about 80 Kpa  
24           to 95 Kpa.

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